

(19) World Intellectual Property  
Organization  
International Bureau



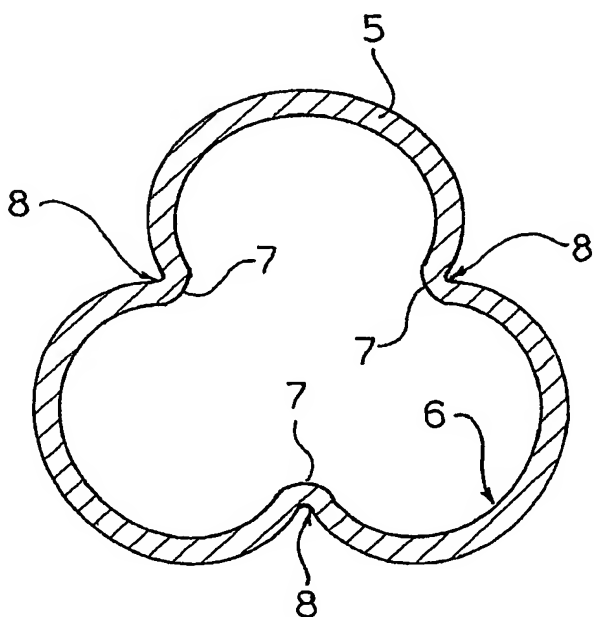
(43) International Publication Date  
31 March 2005 (31.03.2005)

PCT

(10) International Publication Number  
**WO 2005/028849 A1**

- (51) International Patent Classification<sup>7</sup>: **F02M 31/20**, F28F 1/02, F28D 1/047
- (21) International Application Number:  
PCT/EP2004/052222
- (22) International Filing Date:  
17 September 2004 (17.09.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
TO2003 A 000724  
19 September 2003 (19.09.2003) IT
- (71) Applicant (for all designated States except US): **DAYCO FUEL MANAGEMENT S.p.A.** [IT/IT]; Via Andrea Doria, 15, I-10123 TORINO (IT).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **DEFILIPPI, Roberto** [IT/IT]; Via Isonzo, 123/8, I-10141 TORINO (IT). **VILLANO, Antonio** [IT/IT]; Via Dei Colli, 6, I-10020 VALDISSERO TORINESE (IT).
- (74) Agents: **JORIO, Paolo** et al.; STUDIO TORTA S.r.l., Via Viotti, 9, I-10121 TORINO (IT).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A COOLING DEVICE FOR A FUEL-RECIRCULATION CIRCUIT FROM THE INJECTION SYSTEM TO THE TANK OF A MOTOR VEHICLE



(57) Abstract: A cooling device (1) for a fuel-recirculation circuit from the injection system to the tank of a motor vehicle comprises a pipe (2), which is designed to be traversed by the fuel and comprises a side wall (5) which has at least one internal projection (7) obtained by plastic deformation of the side wall (5).